FEELING FAT AND DEPRESSED: POSITIVE DIMENSIONS OF SELF-CONCEPT LESSEN THAT RELATIONSHIP FOR COLLEGE MEN

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The purpose of the current study was to examine if positive family, social, and/or academic dimensions of SC weaken (i.e., moderate) the direct relationship between physical SC (i.e., a person's evaluation of their physique, adiposity, and weight) and depressive symptoms in a sample of adult men. A convenience sample of 239 college men completed self-report measures including the Tennessee Self-Concept Scale-2 (TSCS-2) and Symptom Checklist-90 Revised. Hierarchical regressions revealed that family and social SC were significant moderators of the relationship between physical SC and depressive symptoms, suggesting how men see themselves in their family and social systems affects the aforementioned relationship. Academic SC, however, was not a significant moderator; it was negatively related to depressive symptoms no matter how men felt about their physical selves. Our findings suggest that feeling positively about one's relationships may protect men with poor physical SC from experiencing symptoms of depression at the rates or intensity of their similarly body dissatisfied peers who do not report positive family or social SC. An additional simultaneous regression assessed the contribution of various dimensions of SC to the prediction of depressive symptoms, physical (7.76%), social (8.02%) and academic (6.62%) self-concept accounted for significant amount of variance in symptoms of depression which family SC (2.61%) did not. College counselors who assist men presenting with poor physical SC or depressive symptoms should assess for the other problem, as they commonly co-occur. In addition, they may consider helping them to improve the quality of their relationships in family and social systems as reasonable interventions for both depression and poor physical SC. Importantly, men who experience their academic SC as deficient should

be considered at-risk for depression, although more research is needed to help identify the types of students who report low academic SC. In addition, men with symptoms of depression would likely benefit from accommodations to support their academic functioning.

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CHAPTER 1

INTRODUCTION

Self-concept (SC) is an individual's self-perceptions of their attributes, characteristics, qualities, deficiencies, relationships, and values (Sanchez & Roda, 2007). It is a multidimensional construct related to both positive and negative outcomes (Bracken, 1996; Marsh, 2007; Scheirer & Kraut, 1999). Positive SC development is related to a more desirable psychological well-being and acts as a mediator for positive outcomes such as, future aspirations and positive coping with adversity (Marsh, 2007) (see Appendix A for development of SC). Factor analyses of various SC scales, however, indicate that it is a multidimensional construct with first-order factors representing specific aspects of SC such as academic, social, family, physical ability, and physical appearance and a second-order 'global' SC factor that approximates self-esteem (e.g., Fitts & Warren, 1996; Harter, 1988; Kaminski & Hayslip, 2006; Kaminski, Schafer, Neumann, & Ramos, 2005; Marsh, Craven, & Debus, 1991). Having high SC in some dimensions can be protective and associated with positive health outcomes such as lower depression and positive well-being (e.g., Higgins, 1987; Kostanski & Gullone, 1998; Marsh, 2007). Global negative SC about one's attributes, competency and characteristics predicts greater depression and anxiety, lower global health, and greater health care utilization (Hilbert, Braehler, Haeuser, & Zenger, 2014) and specific dimensions of negative SC are related to numerous undesired outcomes such as anxiety, distress, and depression (Higgins et al., 1985). Specific domains of SC appear to be related differently to various mental health outcomes, however, suggesting that a multidimensional approach is needed to best understand the relationship between self-concept and mental health (Marsh et al., 2004). One dimension of SC that has demonstrated associations to psychological well-being is physical SC.

Physical SC represents the level of contentment a person has regarding their appearance and body shape and weight. Decades of research with women and adolescent girls indicates that low Physical SC is consistently associated with constructs such as greater weight concern, perceived overweight, lower well-being, and frequency of negative self-appraisals about one's appearance (e.g., Friedman, Reichmann, Costanzo, & Mustante, 2002; Friedman et al., 2005; Lowery, 2005; Grossbaard, Lee, Neighbors, & Larimer, 2009; Phillips & Hill, 1998; Ting et al., 2012). In turn, all of these constructs predict negative mental health outcomes such as low self-esteem, disordered eating, and depression in girls and women (Franzoi & Shields, 1984; Friedman, Reichmann, Costanzo, & Mustante, 2002; Friedman et al., 2005; Pliner, Chaiken, & Flett, 1990).

Researchers began to study the correlates and consequences of low Physical SC in subgroups of men (e.g., gay men, body builders) (e.g., Brand, Rothblum, & Solomon, 1992; Herzog, Newman, & Warshaw, 1991; Siever, 1994), however, they discovered that the variety of ways men can be dissatisfied with their bodies made them more difficult to study than women. For example, men report dissatisfaction by believing they are too thin (de Wit, Straten, Herten, Pennix, & Cuijpers, 2010), too fat (Grogan & Richards, 2001), too weak (Kaminski & Hayslip, 2006), and/or not muscular enough [i.e., Muscle Dysmorphic Disorder ([MDD; Pope, Katz, & Hudson, 1993] Kaminski, Chapman, Haynes & Own, 2005; McFarland & Kaminski, 2009; Petrie & Greenleaf, 2007; Tylka, 2011; Woodruff, 2012) for more information see Appendix B). Thus, researchers need to attend to this heterogeneity of body dissatisfaction when investigating the role of low Physical SC on the mental health of men.

While researchers have studied various types of body dissatisfaction in adolescent boys (e.g., Jones & Crawford, 2005; Ting et al., 2012), the extant literature on Physical SC in college

men focuses on mental health outcomes associated with MDD and eating disorders (e.g., Grieve, 2007; Olivardia, Pope, Borowiecki, & Cohane, 2004), conditions with very low prevalence among undergraduates (Eisenberg, Nicklett, Roeder, & Kirz, 2011; Kaminski & McFarland, 2006). Phenomena become increasingly prevalent among college men, however, are overweight and obesity (e.g., Keel, Baxter, Heatherton, & Joiner, 2007; Pedrelli, Nyer, Yeung, Zulauf, & Wilens, 2015). Research is needed in order to explore how increasingly prevalent concerns of negative views of one's body and increased depressive symptoms on college men are related and how the concerns are impacted by other areas of self.

Thus, the current study sampled college men who are of "normal" weight or higher and are not exceedingly focused on building strength and/or muscle mass. Moreover, all men with low Physical SC in the current sample perceive themselves as having too much body fat. Creating a relatively homogeneous sample allows for the investigation of the relationship between low Physical SC due to dissatisfaction with adiposity and symptoms of depression.

After establishing that relationship, we test the ability of various facets of SC to weaken it. That is, despite being dissatisfied with their level of perceived body fat, we expect men who feel good about themselves as students, social beings, or family members to report fewer symptoms of depression than men with low Physical SC who do not have at least one area of functioning that allows them to feel good about themselves. Identifying aspects of SC that moderate the relationship between low Physical SC and depression has the potential to expand the targets of prevention and increase options for intervention for college counselors working with men who have poor Physical SC and/or symptoms of depression. A secondary aim of this study is to assess the relative contribution of different dimensions of SC (physical, family, social, academic) in the prediction of depression in college men.

CHAPTER 2

METHOD

Participants

Undergraduate men (*N* = 292) participated by completing an online survey at a large public university in the south central United States. They did so as part of a larger study completed in 2005. After completing the study, the participants received a debriefing letter outlining the study's purpose (see Appendix C). To ensure that the findings of the current study are relevant despite the archival nature of the data, participants' relevant demographic information, reported height and weight, body dissatisfaction, and depressive symptoms were compared to a sample of men from the same university who participated in 2015 (see Table 1). There were no significant differences across age, self-reported height and weight, ethnicity, class rank, or sexual orientation (see Table 1 for these data and additional demographic information for the current sample). Participants reported their height and weight and we used that data to calculate body mass index (BMI = 703 x (Weight/[Height^2]); CDC, 2016).

To control for differing psychosocial factors and, potentially, protective factors experienced by low weight men (McCreary & Sadava, 2001; Tager, Good, & Morrison, 2006), participants with BMI less than 18.5 were screened out of the current analyses (*N* = 8). This change to our sample was also intended to increase the homogeneity of it, such that, any dissatisfaction with their bodies would be due to adiposity rather than thinness (see Table 2 for BMI categorical descriptives). Two other steps were taken to increase the homogeneity of our sample. First, because collegiate athletes where "bigger is better" or increased muscle mass is encouraged (e.g., football, hockey, weight lifting, rugby, basketball) were removed from the sample (*N* = 38).

Table 1

Descriptive Statistics for Various Demographic Questions

	Study's Sample (n = 239)		2014-2015 (n = 105)		χ^2	χ^2 p value
	n	*%*	*n*	%		
Age in Years					$\chi^2 = 2.89$	$p = .236$
18-24	196	82.01%	92	87.60%		
24-35	43	17.99%	13	12.40%		
Ethnicity					$\chi^2 = 5.74$	$p = .056$
African-American	23	9.62%	12	11.40%		
European-American	166	69.46%	60	57.10%		
Latin-American	28	11.72%	20	19.00%		
Class Rank					$\chi^2 = 6.51$	$p = .089$
First Years	79	33.05%	48	45.70%		
Sophomore	56	23.43%	19	18.00%		
Junior	63	26.36%	23	22.00%		
Senior	41	17.15%	15	14.30%		
Sexual Orientation					$\chi^2 = 2.54$	p = .111
Straight	218	91.21%	90	85.70%		
Sexual Minority	21	8.79%	15	14.30%		
BMI					$\chi^2 =11.08$	$p <$ .001
Normal	127	53.14%	67	64.36%		
Overweight	79	33.05%	20	19.80%		
Obese	33	13.81%	16	15.84%		
	M	*SD*	*M*	*SD*	*t*	*p*
MEBBIE BD	2.42	.69	2.38	.74	.20	$p = .580$
SCL-90-R Depressio	64.03	10.49	63.89	10.32	.44	$p = .670$

Table 2

Body Mass Index Descriptives

BMI Category	*M*	*SD*	Min	Max
Normal	21.75	1.63	18.61	24.68
Overweight	27.08	1.39	25	29.98
Obese	34.06	2.56	30.85	41.34

Another step taken to remove body dissatisfied men whose discontent is a despite for more muscle or fitness, was the removal of participants whose exercise regimen exceeded one hour per day (N = 7), the physical activity guidelines published by the U.S. Department of Health and Human Services (U.S. Dept. Health & Human Services, 2008). To summarize, our sample is comprised of college men who, if dissatisfied with their physical selves, are primarily concerned with the perception or the reality that they have too much body fat. After creating a more homogenous sample, 239 participants were included in the analyses.

One-way ANOVAs assessed for demographic variables that could confound the relationship between physical SC and depressive symptoms college, age group, sexual orientation, and ethnicity. There were no differences in Physical SC or depressive symptoms scores across any variable other than ethnicity (see Tables 3 and 4 for statistics). Although the average Physical SC score for each of the four ethnic groups was within 4 points of an average *T*-score (i.e., T = 50), African American men (M = 51.61, SD = 10.75) scored significantly higher than White men (M = 45.93 SD = 8.83) [$F(1,238) = 2.86$, $p = .038$, $\eta^2 = .035$]. Symptoms of depression, however, did not vary by ethnicity (see Table 3).

Table 3

ANOVA Results for Differences in Physical Self-Concept across Demographics

	M	*SD*	Mean Square	*F*	*p*	η^2
Age in Years			955.54	1.64	.125	.048
18-23	46.97	8.62				
24-35	46.55	11.06				
Ethnicity			336.23	4.10	.037*	.018
African-American	51.61	10.75				
European-American	45.93	8.83				
Latin-American	47.54	8.91				

(table continues)

	M	*SD*	Mean Square	*F*	*p*	η^2
Class Rank						
First Years	45.14	8.52	392.66	1.56	.201	.020
Sophomore	48.06	9.99				
Junior	47.08	8.39				
Senior	48.24	10.35				
Sexual Orientation						
Straight	47.06	8.97	78.09	.46	.631	.004
Sexual Minority	45.14	11.86				
BMI			1752.66	11.29	<.001***	.744
Normal	48.17	8.23				
Overweight	47.65	9.43				
Obese	40.15	9.45				

Table 4

ANOVA Results for Differences in Depression across Demographics Variables

	M	*SD*	Mean Square	*F*	*p*	η^2
Age in Years			87.87	.79	.594	0.024
18-23	64.44	10.4				
24-35	63.90	9.68				
Ethnicity			82.75	.73	.484	.007
African-American	61.70	11.65				
European-American	64.40	10.39				
Latin-American	64.93	11.46				
Class Rank			555.68	1.69	.166	0.021
First Years	64.03	11.06				
Sophomore	66.74	9.03				
Junior	63.19	10.47				
Senior	62.34	10.81				
Sexual Orientation			579.34	2.66	.070	0.022
Straight	63.55	10.40				
Sexual Minority	69.00	10.90				

(table continues)

	M	*SD*	Mean Square	*F*	*p*	η^2
BMI			73.92	0.33	.716	0.836
Normal	64.55	11.01				
Overweight	63.42	9.35				
Obese	63.48	11.20				

Instruments

Demographic Questionnaire

At the beginning of the study, participants spent about five minutes answering 11 demographic questions (e.g., age, race/ethnicity). In addition, they reported participation in organized sport, workout behaviors, and other information not used in the current study (see Appendix D).

Depression

Participants reported their symptoms of depression and other types of psychological distress on the Symptom Checklist-90, revised (SCL-90-R; Derogatis, 1994). Respondents considered how they felt and behaved over the past 7 days and chose from 0 (*not at all*) to 4 (*extremely*) in response to a brief description of 90 symptoms. Subscale scores are converted to *T*-scores, with more than 63 being considered “clinically elevated”. Examples of the 13 items assessing depression include “Feeling low in energy or slowed down” and “Changes in appetite”. The internal consistency reliability of the Depression subscale was excellent (α = .89; see Table 5 for means, standard deviations, and ranges of all variables).

Table 5

Descriptive Statistics for Self-Concept and Depression Subscale T-*Scores*

	α	*M*	*SD*	Possible Scores	Min	Max
Physical SC	.80	46.89	9.18	0-100	20	80
Family SC	.81	44.37	8.98	0-100	20	72
Social SC	.81	46.62	9.18	0-100	20	74
Academic SC	.75	50.00	10.00	0-100	20	73
Depression	.89	64.03	10.49	0-100	38	81

Self-Concept

The 82-item Tennessee SC Scale 2nd edition (TSCS-2; Fitts & Warren, 1996) aims to measure an individual's self-reported sense of self, based on actions, preferences, and feelings. The TSCS-2 measures six dimensions of SC (i.e., Physical, Family, Social, Academic, Moral, and Personal). Personal SC and Moral SC will not be addressed in the current study due to validity issues and the close relationship between global Personal SC and self-esteem. Each item on the TSCS is rated on a 5-point Likert scale from 1, "always false", to 5, "always true" (Fitts & Warren, 1996), with raw scores on each 12 to 14-item subscale converted to *T*-scores. A *T*-score of 60 or greater indicates that the individual tends to feel positive, content, or healthy about the respective dimension of their SC. A *T*-score of 40 or less on any subscale indicates that an individual likely feels dissatisfied with that particular facet of their SC.

Each subscale measures an individuals' perception of their own competency, worth, and positive feelings about a specific dimension of SC. Physical (PHY) assesses an individual's satisfaction with their weight, body, and health. Examples items include statements like "I am an attractive person" and "I have a healthy body". The Family SC subscale employs 12 items to

measure an individuals' feelings of value and relationship quality within their family system. Example items include "My family will always help me" and (reverse scored) "I feel that my family doesn't trust me". Social SC quantifies how individuals perceive their relationships with non-relatives, friendliness, and adequacy in social interactions. Example items include "I get along well with other people" and (reverse scored) "I am mad at the whole world". The Academic SC subscale assesses individuals' views of their competence in school or work settings and how they feels their capabilities are viewed by others in their school or work environments. Items include "Other people think I am smart" and (reverse scored) "I do not know how to work well". Moral SC quantifies individuals' perceptions of the level of dissonance between ideal and actual ethical conduct. Analysis of the Moral dimension of SC suggests it does not operate similarly to subscales reviewed above (Marsh & Richards, 1988) and, therefore, will not be included in our analyses. Personal SC is a global construct that evaluates individual's self-evaluation of their own personal worth and sense of adequacy as a person. Personal SC was not included in the current study because it approximates global self-esteem, a construct that has been widely studied, consistently related to positive outcomes (e.g., Dishman et al., 2006; Orth, Robins, Trzesniewski, Maes, & Schmitt, 2009), and already the focus of prevention and intervention efforts (Chiang, Lu, Chu, Chang, & Chou 2008; King, Vidourek, Davis, & McClellan, 2002; McKay & Fanning, 1992).

Validity reviews support both concurrent and construct validity of the four SC subscales used in the current study (Brown, 1998). With one exception, the internal consistency reliabilities of the TSCS-2 were at least acceptable to good with the current sample (see Table 5).The Academic/work scale's internal consistency, however, was questionable (i.e., $\alpha = .68$). After removing one item, "I am not as smart as the people around me", we achieved acceptable

reliability (i.e., $\alpha = .75$). The Academic SC scale was prorated so that we could use the normed *T*-scores, thereby maintaining unity across variables for clarity of interpretation.

Procedure

Researchers obtained approval to conduct this study through the university's Institutional Review Board. Male undergraduate students volunteered through the psychology department's research portal (SONA). Participants logged onto the confidential and secure website. Students who agreed to participate continued on to the main study website. Participants completed demographic questionnaire, the two measures described above and another instrument that was not used in current study (Appendix D). The questionnaires took approximately 40-60 minutes to complete. In return, the participants received extra credit in their respective courses. Following the administration of measures, each participant was presented with a debriefing letter that explained the study's purpose (see Appendix C) and listed resources for individuals who may have concerns about eating habits, body image, or other types of psychological distress.

Data Analysis

SPSS 22.0 (IBM, 2013) and R (R Corp Team, 2013) were utilized to conduct the data analysis. The PROCESS macro (Hayes & Preacher, 2014) was used with SPSS to conduct the moderation analyses. Missing data was examined and addressed using multiple imputation practices (Schlomer, Bauman, & Card, 2010).

Three hierarchical multiple regressions (HMR) were conducted in Process (SPSS) to determine the main effects and interactions (Hayes & Preacher, 2014) of Family, Academic, Social SC on the relationship between Physical SC and depressive symptoms (for hypothesized

moderation see Figure 1). Specifically, Physical SC was entered into the model followed by a specific TSCS-2 subscale and the Physical SC x TSCS-2 subscale interaction term. Variables were standardized and centered before analyses to aid in interpretation. After running each analysis, changes in R^2 and their significance were interpreted to test for moderation.

To aid in understanding the relative importance of various dimensions of SC on depression in our sample, R was used to calculate Relative Importance. Depression was regressed on Physical SC, Family SC, Academic/Work SC, and Social SC simultaneously.

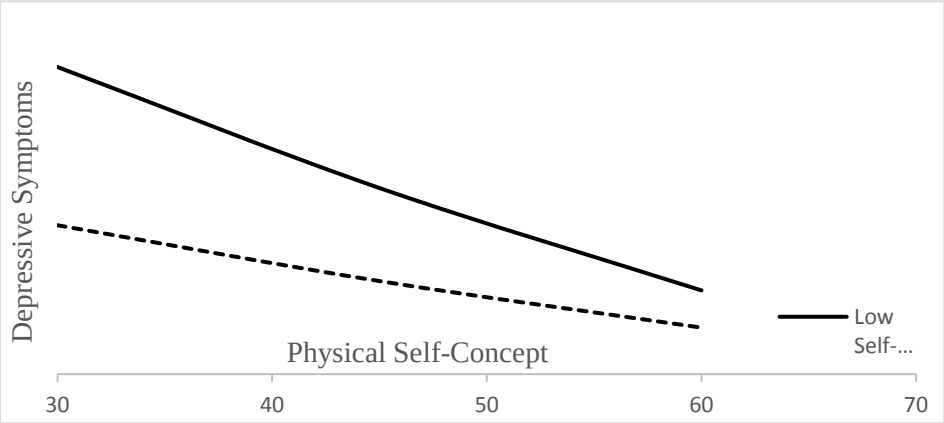


Figure 1. Moderator hypotheses for each facet of SC utilized in the current study (i.e., family, social, academic/work.

CHAPTER 3

RESULTS

The assumptions of multiple regression were not violated. Correlational analyses revealed significant relationships between Physical SC, depressive symptoms, and the other three dimensions of SC (see Table 6). When analyzing the differences across the current study's sample of college men and a sample of 205 college men, a significant difference was observed between levels of BMI (Body Mass index). Specifically, the current sample had significantly more overweight and obese men than the 2015 sample ($\chi^2 = 11.08$, $p < .001$).

Table 6

Bivariate Correlations among Self-Concept Subscales and Depression

	Physical SC	Family SC	Social SC	Academic SC
Family SC	.34*			
Social SC	.53*	.40*		
Academic SC	.24*	.22*	.34*	
Depression	-.39*	-.26*	-.41*	-.34*

In each of the three HMRs, the main effects of Physical SC and the other dimension of SC were significant individual predictors of symptoms of depression. Moreover, the inclusions of the interaction of Physical SC with Family SC and Social SC were also significant, although its interaction with Academic/Work SC was not (see Tables 7 and 8; see Figures 2, 3, & 4).

Specifically, results of the Family SC hierarchical multiple regression revealed that for every 1-point increase in Physical SC *T*-scores there was a .40 decrease in reported depressive symptom *T*-scores ($b = -.40$, $SE_b = .06$, $p < .001$; Table 8). Family SC was also significantly different from zero, $b = -.21$, $SE_b = .07$, $p < .002$ (see Table 8). Thus, for every 1-point increase

in Family SC *T*-scores, there was a .21 decrease in reported depressive symptom *T*-scores. As hypothesized, among Men with low Family SC, they tended to report fewer depressive symptoms if they were high in Physical SC than if they had low Physical SC (see Table 7; see Figure 2). In addition, within men who reported lower Physical SC, men with low Family SC reported higher depressive symptoms compared to men with high Family SC. However, for men who indicate positive Physical SC, men with high Family SC reported more depressive symptoms than men with low Family SC

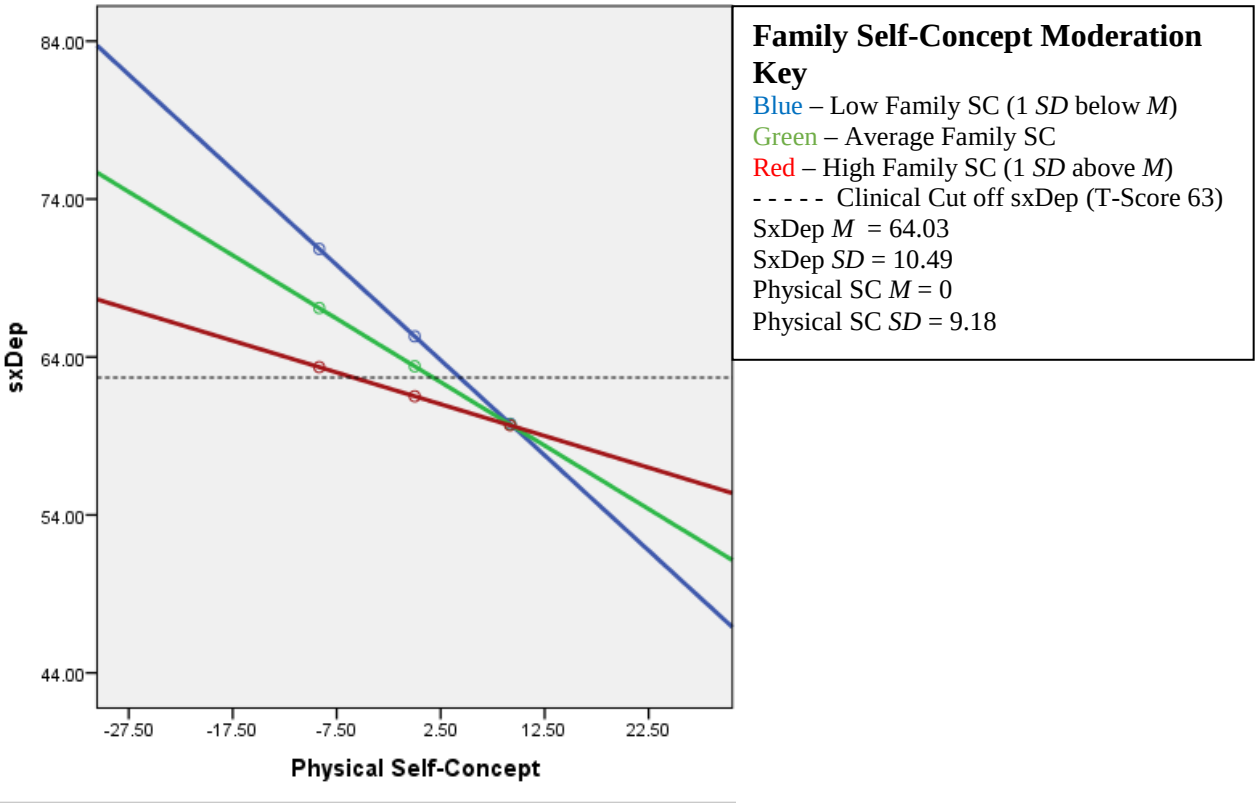
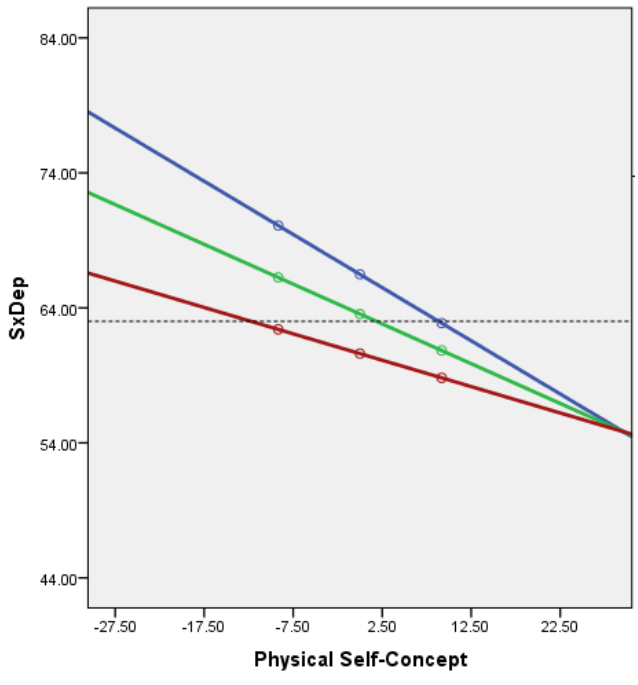


Figure 2. Family SC PROCESS moderation between T-Scores of Physical SC and Depressive symptoms.

The second hierarchical multiple regression revealed that effects s of the Physical and Social SC were significantly different from zero, b = -.30, SE_b = .09, p < .001, and b = -.32, SE_b = .09, p < .001, respectively (see Table 8). Specifically, for every 1-point increase in Physical SC *T*-scores, there was a .29 decrease in *T*-scores of reported depressive symptoms and participants demonstrated a .32 decrease in reported depressive symptom *T*-scores for every 1-point increase in their Social SC score. Moreover, as hypothesized, Social SC significantly moderated the relationship between Physical SC and depressive symptoms (see Table 7; see Figure 3). Specifically, fewer depressive symptoms were reported by men with high Social SC who indicated low Physical SC, than if they reported low Social SC. The overall relationship between low Social SC and depressive symptoms was decreased in men with higher Physical SC.



Social Self-Concept Moderation Key
Blue – Low Social SC (1 *SD* below *M*)
Green – Average Social SC
Red – High Social SC (1 *SD* above *M*)
- - - - - Clinical Cut off sxDep (T-Score 63)
SxDep *M* = 64.03
SxDep *SD* = 10.49
Physical SC *M* = 0
Physical SC *SD* = 9.18

Figure 3. Social SC PROCESS moderation between T-Scores of Physical SC and Depressive symptoms.

The third hierarchical multiple regression revealed that for every 1-point increase in Physical self-concept score, there was a .38 decrease in reported depressive symptoms for one item (b = -.38, SE_b = .06, $p < .001$; see Table 8). Academic self-concept was also significantly different from zero (b = -.26, SE_b = .06, $p < .00$; see Table 8). The significant main effect demonstrated a .26 point decrease in depressive symptom *T*-scores for every 1-point increase in Academic self-concept *T*-scores. In addition, Academic SC did not significantly moderate the relationships between Physical SC and depressive symptoms (see Table 7; see Figure 4). An ANOVA analysis between low, average, and high Academic SC was conducted to further understand the differences in reported depressive symptoms between groups. Results revealed significant differences between levels of Academic SC ($F(2, 62) = 9.42$, $p < .000$), specifically, that high Academic SC reported significantly higher depressive symptoms than both low and average Academic SC.

Table 7

Moderation Results of Multiple Regression Testing Family, Academic, and Social Self-Concept as Moderators of Physical Self-Concept and Depression Relationship

	R	R^2	*SE*	*F*	ΔR^2	*p*
Family SC Model	.46	.21	9.60	28.52		<.001***
Physical SC x Family SC interaction	.50	.25	9.37	19.78	.04	<.001***
Social SC	.47	.22	9.38	26.54		<.001***
Physical SC x Social SC interaction	.48	.23	9.33	4.45	.01	.040*
Academic SC	.47	.23	9.33	22.85		<.001***
Physical SC x Academic SC interaction	.49	.24	9.33	3.08	.01	.081

Table 8

Results of Moderation for Family, Academic, and Social Self-Concept as Moderators

	b	*SE*	*B*	*t*	*p*
Family Self-Concept Regression					
Family SC	-.21	.07	-1.22	-3.13	.002**
Physical SC	-.40	.06	-1.08	-6.35	<.001***
Intercept	.02	.01	1.50	4.45	<.001***
Social Self-Concept Regression					
Social SC	-.32	.09	-.70	-3.67	<.001***
Physical SC	-.30	.09	-.72	-3.47	<.001***
Intercept	.01	.01	.80	2.11	.036*
Academic Self-Concept Regression					
Academic SC	-.27	.06	-.75	-4.31	<.001***
Physical SC	-.38	.07	-.68	-5.87	<.001***
Intercept	.01	.01	.67	1.77	.078*

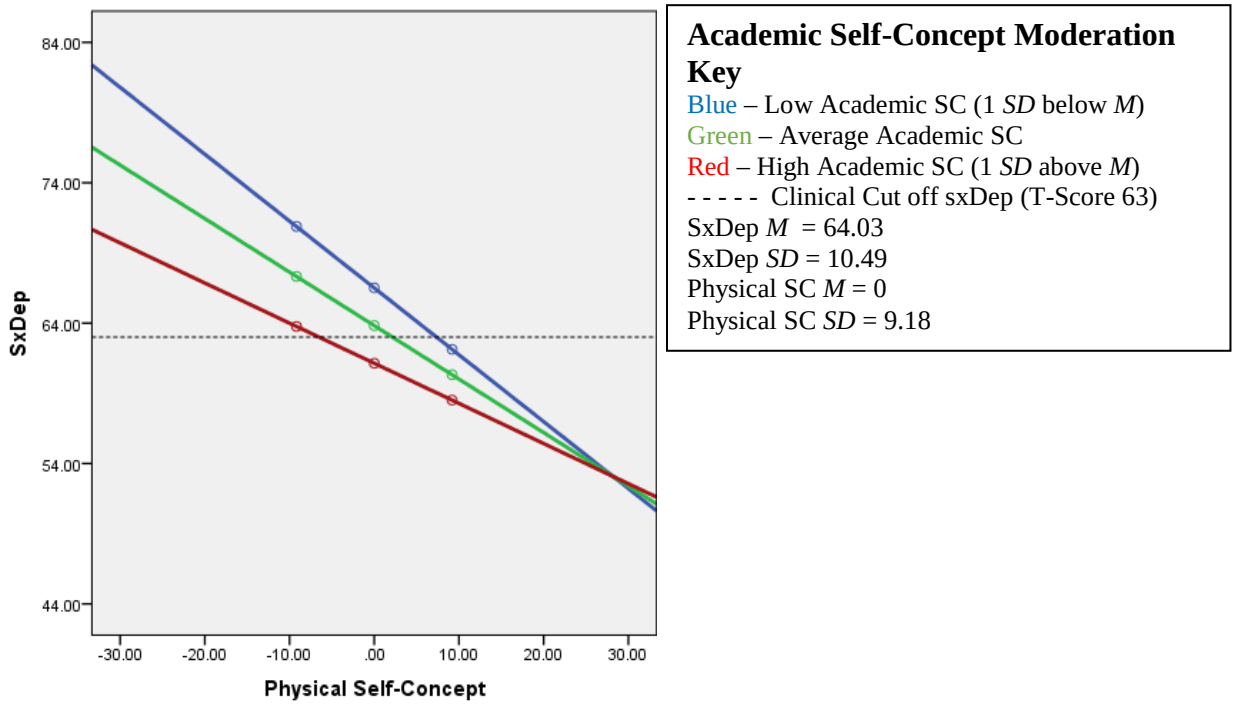


Figure 4. Academic SC PROCESS moderation (non-significant) between T-Scores Physical SC and Depressive symptoms.

Self-Concept (SC) Facets Multiple Regression

Analyses of normality, multicollinearity, and homoscedasticity did not violate regression assumptions. The model with Physical SC, Family SC, Social SC, and Academic SC was significant ($F(4,234) = 19.51$, $p < .001$) accounting for 25.01% of the variance in depressive symptoms (*Adjusted* $R^2 = .24$; see Table 9). More specifically, Physical, Social, and Academic SC were significant predictors of depressive symptoms. Participants with higher Physical, Social, or Academic SC had lower depressive symptoms. On average, individual depressive symptoms *T*-scores decreased by .24 for each 1-point increase in Physical SC *T*-scores. In addition, for every 1-point increase in Social SC and Academic SC *T*-scores, there was a .22 decrease in *T*-scores of reported depressive symptoms. Family SC, however, did not significantly predict depressive symptoms (see Table 10 for *b* and *SE*). To further understand the unique contribution of each predictor, the relative unique importance of each predictor was examined and was as follows: $sr^2 = .03$ for Physical SC, $sr^2 = .004$ for Family SC, $sr^2 = .02$ for Social SC, and $sr^2 = .04$ for Academic SC. The contribution to the overall model was: 7.76% for Physical SC, 2.61% for Family SC, 8.02% for Social SC, and 6.62% for Academic SC. Of the 25% of variance in depressive scores accounted for, 15.6% was shared variance and 9.4% was unique variance contributed by dimensions of SC (see Table 10).

Table 9

Results for Simultaneous Multiple Regression of Dimensions of Self-Concept Predicting Depression

Independent Variables	*R*	R^2	*SE*	*F*	*p*
Physical, Family, Social, Academic SC	.50	.25	9.16	19.51	<.001*

Table 10

Results for Simultaneous Multiple Regression Analyses

Multiple Regression Model	*b*	*SE*	*B*	*t*	*p*	Sr^2
Physical SC	-.24	.08	-.21	-3.07	<.001***	.031
Family SC	-.06	.08	-.07	-.76	.447	.004
Social SC	-.21	.08	-.38	-2.47	.014	.024
Academic SC	-.21	.06	-.34	-3.27	<.001***	.038

CHAPTER 4

DISCUSSION

Two of three hypotheses were supported. Specifically, having better Family and better Social SC reduced the relationship between Physical SC and symptoms of depression; however, Academic/Work SC did not act as a significant moderator. While Physical SC remained the strongest predictor of depression across analyses, Social SC and, to a lesser extent, Family SC, appeared to protect against depression among men with poor Physical SC.

Family, Social, and Academic SC were all significantly and negatively associated with reported depressive symptoms and positively associated with Physical SC. Higher SC in one facet was correlated with higher SC in other facets and lower reported depressive symptoms (see Table 6). Specifically, Physical and Social SC had the highest correlation (.53; see Table 6).

Our results indicate that having low Family and Physical SC has an additive effect on experienced depressive symptoms. Family SC significantly changed the relationship between Physical SC and depressive symptoms, but the direction of change was only as hypothesized for men with low Physical SC. Specifically, among men with below average Physical SC, high Family SC was associated with SCL-90-R Depression scores that were lower than those of men with low Family SC. At average levels of Physical SC and above, however, men scored below the clinical cut-off on the SCL-90-R no matter what their level of Family SC. The moderating effect of Family SC does not occur among men who have high Physical SC; they report subclinical levels of depression no matter how they feel about their family relationships (see Figure 2). Overall, among men that feel dissatisfied with their physical self, Family SC is a strong factor in the relationship to fewer depressive symptoms.

One interpretation may suggest that men who also experience positive Family SC, despite reporting negative views of one's own body, may have developed a more secure attachment to their family systems and experience less depressive symptoms due to the support they receive from family members and the confidence they possess in their own family role. Having a strong bond and positive perceptions of one's role in their family system, however, may also create expectations to provide and be successful for the family unit. For men, society reinforces positive SC regarding one's physical appearance and ability, however culture and society also create expectations surrounding a man's role to be successful, create a positive reputation, and help support family. Despite having high Physical SC, men who report high Family SC and feel pressure to fill cultural or societal expectations of being a man in their family may experience more depressive symptoms than men who do not report feeling competent and connected to their families. Ethnic minority men were overrepresented within participants who reported low Physical SC and high Family SC. Macro-level socio-cultural stressors such as discrimination, microaggressions, and stereotyping may then contribute to higher levels of reported depressive symptoms, despite feeling connected to and competent with family unit. Due to the correlational nature of analyses, inverse relationships must also be considered. Men who experience more depression may then have less energy and motivation to engage in physical activity or to interact with family and, therefore, may be more likely to report lower Family SC.

Similarly, for men who have negative perceptions of their bodies and appearance, positive views of one's own adequacy in relationships may help decrease the reported SCL-90-R depressive scores. However, negative evaluations of one's friendliness and competence in social relationships may contribute to depressive symptomology, in college men who are dissatisfied with their physical selves (see Figure 3). Men with positive Social SC may be more likely to

interact and engage in social situations with peers and feel more connected with a support system. Having a support system and developing interpersonal relationships within a social system then appears to be related to lower depressive symptoms, despite having negative views of one's own body. Within the college setting, belonging and feeling connected appears to be an important aspect of university culture. Men that feel competent in this area, despite low Physical SC, may feel more accepted and positive about their college experience. Low Physical SC may also be related to media-driven masculine ideals that becomes internalized and may fuel men to compare themselves to unrealistic expectations, possibly influencing the development of depressive symptoms. However, men that are accepted by others in social settings and perceive themselves as socially competent may then experience less depressive symptoms than men who feel unaccepted and media-driven to meet a physical ideal. Overall, despite negative images toward overweight people in media, men who feel positively about their social relationships, even if they have low Physical SC, experience less depressive symptoms. In order to address the correlational nature of analyses, interpretations must consider that men who experience high amounts of depressive symptoms may also feel more withdrawn and engage in more isolating interpersonal behaviors, thus influencing a more negative evaluation of Social SC and possibly decreasing physical activity levels.

The moderation analysis for Academic SC was not significant. That is, participants with high Academic SC reported lower depressive symptoms than participants with lower Academic SC, across levels of Physical SC. The pattern was consistent for moderate and low levels of Academic SC as well. The strong relationship between Physical SC and depression was not significantly impacted by Academic SC (see Figure 4). When categorically comparing depressive symptoms across three levels of Academic SC (low, average, high) in post hoc

analyses, men who report high Academic SC also report significantly lower depression symptoms than men who indicate low or average Academic. Therefore, high levels of Academic SC (> T score of 55) appears to impact the relationship with symptoms of depression. Results suggest that men who have positive (above average) view of their own academic ability, and believe that academic competence is a core component of their identity, are less likely to experience depressive symptoms than men who do not have academics as a source of identity or confidence. Men who may feel bad about themselves socially or physically, may benefit from having high Academic SC, as feeling competent in academics appears to be related to less depressive symptoms, no matter if one feels positively or negatively toward their body. Considering the high correlation between Physical and Social SC, men who feel positive about their academics may have a different source of confidence that buffers them from experiences of depression. The relationship between Academic SC and Physical SC may also occur in the opposite direction, as men who experience less depression may have more motivation, energy, and internal locus of control, therefore, resulting in more engagement in academic environments.

In order to further understand the contribution of different areas of SC in predicting depressive symptoms, the current study examined the relative importance of each facet and the unique variance accounted for by each facet of SC in a multiple regression. First, the combination of all four dimensions of SC accounted for 25% of the variance in depression scores. Relative importance analyses display that Social and Physical SC both make significant contribution to the prediction of depressive scores. Considering that Social and Physical SC are highly correlated, these SC facets may be inter-related. College campuses tend to be environments that demand social and physical competency, often offering a time-period where students begin to examine and develop social skills and physical habits. Within the college

context, Physical and Social SC are important areas to explore when addressing depressive symptoms.

Moreover, as expected, there is large proportion of shared variance (i.e., 16%) among these predictors that are all also related to Global SC. The facets of SC that have the strongest unique contributions to depression as Academic (4%), Physical (3%), and Social (2%). The unique contribution of Family SC is negligible (.4%), despite how normal weight and heavier college men feel about their bodies. Academic accounts for the largest amount of unique variance, suggesting that Academic SC may offer a point of intervention for men, no matter their views of their own physical self. Strong Academic SC may have a buffering effect against symptoms of depression; in addition or alternatively, students suffering with symptoms of depression may have more difficulty in school and/or feeling satisfied with their academic selves. Past research has observed Academic SC to be associated increased depressive reactions, lower grades, and decreased self-esteem (e.g., Hallinan & Kubitschek, 1999; Van Houtte, 2005).

Counseling Implications

For men with negative perceptions about their physical bodies, strength, and appearance that experience depressive symptoms, programs and psychologists can work to address and develop Social SC and Physical SC. Developing positive perceptions of men's social competency and positive views of their own bodies may help to buffer against symptoms of depression, according to the current study. In intervention planning for college men, addressing one's own view of their friendliness and relationship adequacy may have the largest impact on protecting against or addressing current experiences of depression. Considering the high

correlation with Physical SC, developing a more positive Social SC, may also help to build higher views of one's physical self.

Specific outreach programs that address social skill education, social-event information, weight-loss programs, activity fairs, and college-wide events that encourage increase student networks. Interventions may include interpersonal processing groups and social skill development and practice. College environments that encourage club, organization, and interactive school engagement may help to address the social competency in male students.

Furthermore, having high Academic SC is associated with lower depressive symptoms and therefore, developing Academic SC may be a way to intervene against depressive symptoms, despite one's view of their own body. Therefore, for men at all levels of Physical SC, helping to develop a strong sense of identity and competence in academic areas can be beneficial against the experience of depressive symptoms. Interventions to address Academic SC resources such as tutoring, supplemental instruction, and resuscitation classes. In addition, universities have access to GPA and test score records, therefore, offering an objective way to examine male students that may be at risk for depression when GPAs or scores change negatively over time.

Limitations

Several limitations within the current study require discussion and may prompt additional research. First, all participants were collected from only one university setting, therefore, limiting the generalizability of findings. Information from a variety of universities (i.e., metropolitan, rural, area in the U.S, private liberal arts, elite universities, etc.) would contribute greatly to the generalizability. In addition, participant responses were gathered in a cross-sectional manner, therefore, limiting the interpretation of possible risk factors to the development of depression, as

the directionality of all correlations is unknown. Furthermore, in terms of our negative findings regarding Academic SC as a moderator, Siemsen, Roth, and Oliveira demonstrated that Common Method Variance can inflate or deflate multivariate multiple regression models, stating that interaction terms may be more difficult to detect (2010).

African American men in the current study's sample had significantly higher Physical SC scores compared to White men, although their depression scores did not differ across ethnicities. Therefore, the results of this study may not apply to African American men in the same way. Nevertheless, African American men may still benefit from interventions or treatments that address Family, Social, and Academic SC to buffer against depressive symptoms.

Significant differences also occurred between BMI classifications in the current sample compared to the 2015 sample. Over the previous decade, developing countries have observed a trend of stabilizing in the prevalence of obesity in children and adults (An, 2014; Wabitsch, 2014). The differences between the current study's sample and the 2015 sample in BMI, therefore, are likely not due to actual decreases in obesity or overweight prevalence among college men. Rather, the differences may be related to an increase, over the past ten year, in pressure on males to misreport BMI.

All instruments used in this study were self-reports. Of particular concern was self-reported height and weight, which were not accurate in a demographically similar sample of men from the same university who were weighed and measured without advance notice. First, underweight and heavily muscled men were removed from the sample to approximate the current sample. Among the remaining 103 men, most (87.4%) report height and weight that put them into the correct BMI category, but underestimated their true BMI by 1-4 points. Only 2 men overestimated their BMI enough to be placed in a higher incorrect BMI category, but 11 men

over-reported their height and/or underreported their weight enough to be moved to a lower BMI category (P. Kaminski, personal communication, November 20, 2017). Such inaccuracy of self-reported height and weight is a limitation of the current sample and may also explain why BMI and depression were not significantly correlated. Future research may compare self-reported and measured BMI and how discrepancies relate to Physical SC, depressive symptoms, and other constructs such as disorder eating and Global SC.

Future Directions

In addition, to collecting information about men's height and weight to determine body type and composition, additional information such as academic test scores and GPA may also add to the understanding the association of different dimensions of SC with depressive symptoms. To further understand the unique variance of depressive symptoms that Academic SC accounts for, acquiring how changes in or perceptions of GPA may influence reported depressive symptoms would aid in the understanding of how Academic SC may be a risk or protective factor in college men. Furthermore, more research would assist colleges in becoming more aware of what puts male students at risk for depression.

In the development of interventions, future research may also focus on the longitudinal protective factors in the development of depression in college men. Utilizing the results from the current study, exploration of interventions addressing facets of SC may be beneficial to further understand how positive and growth-oriented self-perceptions may decrease the likelihood of depressive symptoms.

The transition into adulthood and college can be a source of stress; evidence suggests the many college students show a rise in distress, depressive symptoms, obsessiveness, and difficulty

coping with adversity (Fisher & Hood, 1987). Investigating, the influence of college transition on SC, body weight, and depressive symptoms may also help to create specific interventions for college men that address other stressful factors. Finally, explorations regarding specific differences between men and women in the influence of different aspects of SC on depression may allow for more specified treatment or preemptive intervention.

Overall, the current study theorized that college men's Physical SC would be related to depressive symptoms. Furthermore, different positive facets of SC (i.e., Family, Social, and Academic) would each act as a moderator and buffer the experience of depressive symptoms in men who feel negatively about their physical appearance and features. The results demonstrate a moderating effect for Family and Social SC, but not for Academic SC. Although Physical SC, is the strongest predictor of depression in college men, Social, Family, and Academic SC all significantly predict depressive symptoms as well. Unique variance and relative importance analyses convey that Physical, Social, and Academic SC may be most influential on the relationship between Physical SC and symptoms of depression. Therefore, intervention and therapy could address beliefs of one's own social competency, especially those with negative Physical SC. In addition, fostering academic SC in college men may help to decrease experienced depressive symptoms, despite how men feel about their physical body or appearance.

APPENDIX A

MODEL FOR SC

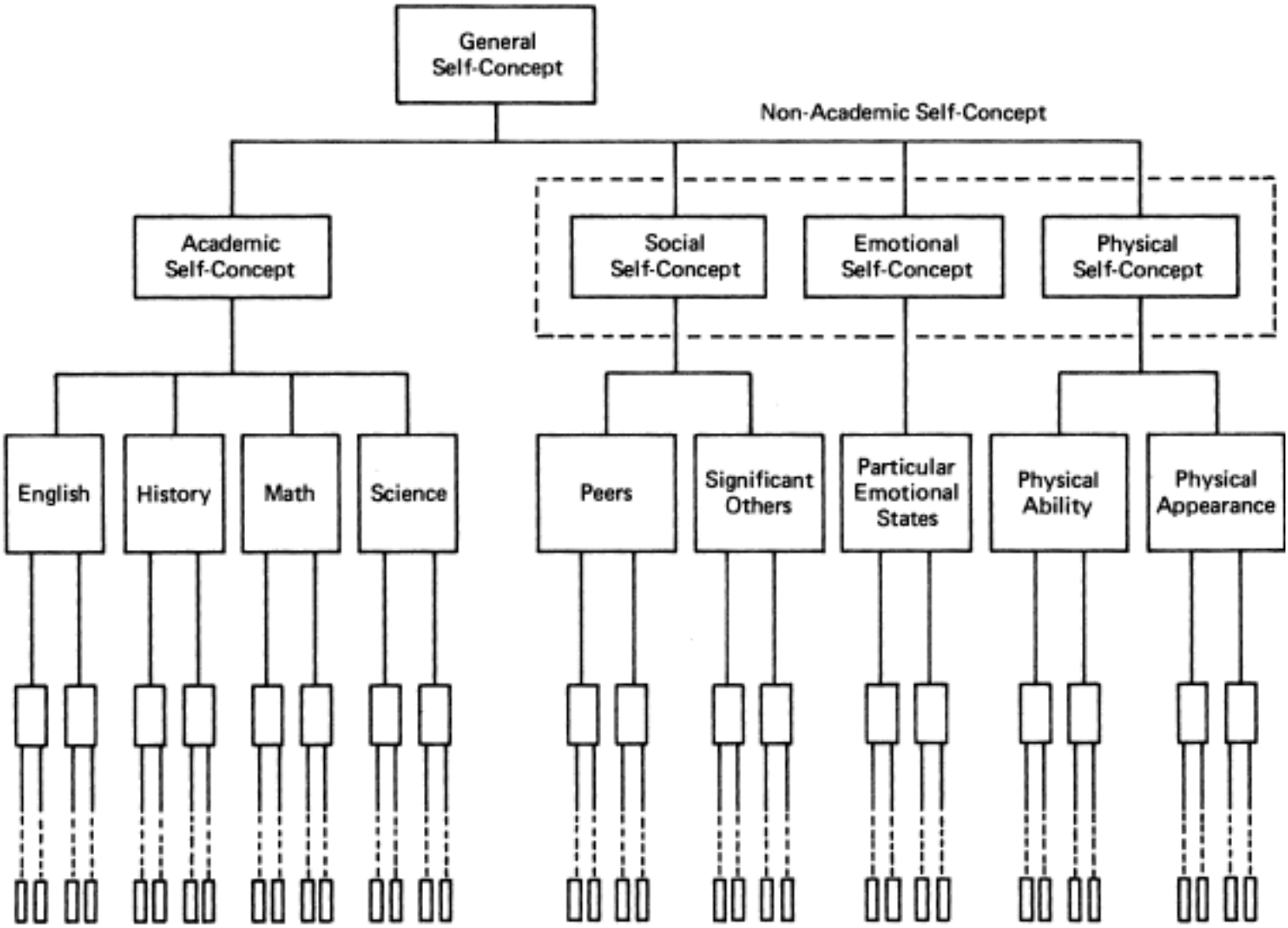


Figure A.1. Hierarchical Model for Multi-dimensional Self Concept (Shavelson, Hubner, & Stanton, 1976).

Shavelson, Hubner, and Stanton (1976) propose a hierarchical model of SC theorizing that at the top of the hierarchy is global SC, with broader domains of self below (e.g., social, physical, and academic). Perceptions of personal behavior in a specific situation and people's unique individual experiences fall at the bottom of the hierarchy (Shavelson, Hubner, & Stanton, 1976; see Figure A.1). Global SC is a higher order construct divided into two components:

academic and nonacademic SC, with these broad domains divided further into specific group factors (Shavelson, Hubner, & Stanton, 1976).

The trait stability of SC, as theorized by Shavelson, Hubner, and Stanton, varies among hierarchical levels (1976). Stability decreases at lower levels of the hierarchy as shifts occur in experiences resulting in changes in sublevels of SC to accommodate new experiences (Shavelson, Hubner, & Stanton, 1976). Higher levels of the hierarchy are less influenced to change and would require numerous experiences inconsistent with the normative perception in order to adapt (Ludwig & Maehr, 1967).

Development of SC

People's experiences create data that is then incorporated into their SCs by categorizing and organizing. At infancy, SC tends to be undifferentiated from the environment, but as individuals mature and learn from experiences, the self becomes increasingly distinct from the surrounding world (Shavelson, Hubner, & Stanton, 1976). Marsh hypothesized that young children have consistently positive SCs; however, as they engage in the environment, children begin to learn their strengths and weaknesses (1989). In turn, children's SCs become differentiated and correlated with external feedback regarding facets of themselves (e.g., feedback from others, accomplishments, and skills). In support of the differentiating hypothesis, SC sub-scales display smaller correlations with each other in 5 to 11 year olds than older children (Marsh, Craven, & Debus, 1991; Marsh & Shavelson, 1985). Marsh (1989) observed a plateau in differentiation during late preadolescence, as cognitive abilities become more fully developed.

Harter proposed a model of SC development where SC becomes more abstract and more differentiated with age (1993). For example, SC of being smart differentiates into specific aspect related to school and academics (Harter, 1993). During early childhood, as theorized by Harter, children have difficulty differentiating between actual and desired attributes of themselves, therefore creating unrealistically positive SCs (Harter & Pike, 1984). Young children then develop sets of related attributes and begin to label experiences as good or bad, thus influencing a more unidimensional approach to attributes (i.e., all-or-none thinking; Harter & Pike, 1984). Major features of self-descriptions in early childhood include observable behavior, skills, possessions, preferences, and psychical characteristics (i.e., I like pizza and have a dog. I can recite my ABCs and I can run fast; Harter, 1988). In addition, self-statements are constructed without organization or systematic categorization in young children and they are often unable to identify misrepresentations or inconsistencies (Harter, 1988).

Middle childhood brings an increased capability to integrate experiential data within systems of attributions and self-descriptions, thus conveying a balanced understanding of competencies based on external related feedback (Harter & Pike, 1984). However, perceived competency appears to decline and become more realistic as children age. (Marsh, 1988). For example, in a study of 300 early elementary school, school SC was declined between kindergarten and 2nd grade (Marsh, Craven, & Debus, 1998). One reason for the decline to a more realistic self-view may be experiential data, which includes the evaluation, reactions, and feedback from significant people in individuals' lives (Haas & Maehr, 1965). Information from others, as well as social comparison, then is incorporated into self-perception (Harter, 1988). For instance criticizing that occurs after completing a task appears to influence the participants' self-reported SC both immediately and after a delay (Haas & Maeher, 1965). Another major feature

of self-descriptions in middle childhood is the emergence of trait labels such as smart, helpful, caring, athletic, or popular (Harter, 1988). At this stage in development, trait labels are then followed by an elaboration of how a specific trait was selected (i.e. I am popular because of my helpfulness and ability to keep secrets for my friends; Harter, 1988).

Adolescence is characterized by increasingly abstract self-descriptions (Harter, 1983; Harter, 1985). Rosenberg (1979) proposed that adolescents, unlike at younger ages, begin to describe their psychological interior, such as their feelings, thoughts, and personality (i.e., moody, self-conscious, or affectionate). With more advanced cognitive development, adolescents begin to integrate and synthesize traits, into more complex patterns, as well as discuss self-perceptions in relation to others (Harter, 1988). The hierarchical factor structure differentiates significantly by adolescence and, therefore, correlations between SC domains are lower in comparison to young children (Harter, Waters, & Whitesell, 1998; Marsh, Craven, & Debus, 1998). Adolescents, more so than younger children, can discuss specific domains of themselves as differing in importance (Harter, 1988). Marsh suggested a pattern of decreasing SC through pre-adolescence, where SC plateaus before increasing through early adulthood (1989). With increasing life experiences, older children also have more accurate self-perceptions of their strength and weaknesses, compared to the more universally positive self-competency views in young children (Marsh, 1989).

APPENDIX B

BODY WEIGHT

Body weight also plays a role in influencing individuals' mental health (e.g., Carpenter, Hasin, Allison, & Faith, 2000), physical health (e.g., Must et al., 1999), and overall quality of life (e.g., Jia & Lubetkin, 2005). Researchers have documented numerous negative outcomes associated with being overweight, including an increased risk for heart disease, adult onset diabetes, depressive symptoms, and suicidal ideation (Must et al., 1999; Carpenter et al., 2000).

Obese and overweight labels are applied based on individuals' Body Mass Index (BMI). BMI is a way of computing body adiposity as a function of a person's height and weight (i.e., weight (kg) / [height $(m)^2$) (Center for Disease Control and Prevention [CDC], 2016). Although BMI is less accurate than other measures of adiposity and body mass, it is widely used because of the easy access to height and weight data. The CDC and Prevention follows an expert committee's recommendations for BMI guidelines. A BMI of greater than 30 is considered obese, 25-29.99 is overweight, 18.50-24.99 is normal, and under 18.5 is underweight (Barlow & Dietz, 1998). The terms overweight and obese are used here to designate the various BMI levels indicated by the Center of Disease Control and Prevention.

Unfortunately, BMI is often inaccurate because it fails to account for factors that may contribute to body mass beyond weight and height. In a study conducted with over 1,300 men and women, BMI accurately predicted obesity, as measured by body fat percentage, in about 75% of male participants, when compared to the standard of body adiposity composition, duel-energy x-ray absorptiometry (DEXA; Shah & Braverman, 2012). Another study of over 1,600 adults yielded similar results, identifying about 30% difference between the BMI classifications and DEXA measurements (Kennedy, Shea & Sun, 2009). The major limitation of BMI is its inability to discriminate between lean mass and body fat, as the BMI formula generates higher numbers for heavily muscled people and even misclassifies them as overweight or obese

(Romero-Corral et al., 2008). In addition, self-reported height and weight values can overestimate lower BMIs and underestimate higher BMIs, when compared to physical measurement based BMI (Stommel & Schenborn, 2009). For example, Stommel and Schenborn (2009) found that, in a sample of 17,000 individuals, 16% were misclassified as "normal" instead of "overweight" due to the tendency for overweight and obese men to under report their weight. Spencer, Appleby, Davey, & Key (2001) suggested that men were more likely than women to overestimate their BMI, and women were more likely than men to underestimate their BMI. Given the limitations of BMI measurement and self-reporting weight, the current study will utilize physical SC, and therefore, examine how men perceive their own physical features, strength, and appearance.

Prevalence of overweight and obesity in the U.S. have risen over the last few decades (Haidar & Cosman, 2011; Popkin, Adair, & Ng, 2012). Results from the 2009-2010 National Health and Nutrition Examination Survey (NHANES) indicate 33% of U.S. adults aged 20 and over are overweight (Fryar, Carroll, & Ogden, 2012). Prevalence of obesity among the general population, is estimated at 35.7%, with the prevalence for the extremely obese (BMI > 40) reaching nearly 6.3% (Fryar, Carrol, & Ogden, 2012). Therefore, nearly 2/3rd of adults are overweight or obese (Fryar et al., 2012). Obesity rates in the US have increased among both men and women from 1988 to 2010 across three ethnic groups: non-Hispanic white, non-Hispanic black, and Mexican American. More recently, in 2013-2014, obesity prevalence was 37.9% overall, with men at 35.2% and women at 40.5% as defined by >29.99 BMI (Flegal, Kruszon-Moran, Carrol, Fryar, & Ogden, 2016).

American young adults (ages 18-29) are also experiencing high rates of obesity (Mokdad et al., 1999). Height and weight measurements gathered in the NHANES indicated that 15.5% of

12-19 year olds were overweight in 2000. Among non-Hispanic black children and Mexican American children, the prevalence of overweight increased by more than 10% between 1988 and 2000 (Ogden, Flegal, Carrol, & Johnson, 2002). Obesity prevalence from 2011-2012 estimates obesity amongst non-Hispanic black youth and Hispanic youth are 20.2% and 22.4% respectively (Ogden, Carroll, Kit, & Flegal, 2014). When comparing the NHANES data from 1999-2000 to the results from 2009-2010, an increase in obesity was observed in males ages 2 to 19 years, but not observed in females ages 2 to 19 years (Ogden, Carroll, Kit, & Flegal., 2012). Prior psychological research has commonly explored weight-related concerns and consequences in girls and women, but the literature on overweight and obese boys and men is sparse. More research, therefore, is necessary to explore how being overweight affects males.

Body Weight and Depression. Depression is often observed in samples of overweight/obese people (e.g., Carels et al., 2010; Dragan & Akhtar-Danesh, 2007; Friedman et al., 2005). In an analysis of over 3300 adults, ages 18-70, the prevalence of depression for people of normal weight was 11%, and for overweight and obese individuals the prevalence of depression was 12% and 23%, respectively (Carey et al., 2014). Additional evidence suggests that 19.7% adults reported major depressive symptoms and 24.3% reported moderate-severe depressive symptoms (Zhao et al., 2010). More specifically, abdominal obesity and increased waist circumference, assessed in a NHANES study, were associated with increased likelihood of major depressive disorder and depression symptoms among both overweight and obese participants (Zhao et al., 2010). Abdominal obesity is even more strongly correlated with depression among adults with elevated BMI, when compared to their high BMI peers with more evenly distributed adiposity (Roberts, Kaplan, Shema, & Strawbridge, 2000; Zhao et al., 2010).

Numerous studies support the notion that abdominal obesity seems particularly associated with depression in both men and women (Rivenes, Harvey, & Mykletun, 2008).

Research observes depressive patients as having higher levels of inflammatory cytokines, acute phase proteins, chemokines, and other inflammatory responses (Raison, Capuron, & Miller, 2006). Furthermore, cytokine levels may act to increase activation of a CNS inflammatory response, which is related to depression (Raison et al., 2009). Activation of pathways of inflammation appears to be related to a decrease in neurotrophic support and altered use of glutmate in the brain (Miller, Maletic, & Raison, 2009). Inflammation, gut bacteria, and high cortisol levels which can increase the body's inflammatory response, also appear to be related to weight gain and obesity (e.g., Leo et al., 2006; Yilmaz, 2008). Therefore, previous research suggests a physiological relationship between high weight and depressive symptoms.

The association between overweight/obesity and mood disorders is supported across men and women of all ages (Mather, Cox, Enns, & Sareen, 2009). For example, Goodman and Whitaker (2002) found that, in a sample of over 9,000 adolescents, depressive symptoms at baseline was a significant predictor of obesity for adolescents who were not yet obese at baseline. Notably, the odds of becoming obese doubled if the adolescent had a depressed mood at initial measurement (Goodman & Whitaker, 2002). Similarly, a 2005 adolescent health study found that overweight adolescents, as determined by BDI, report more depressive symptoms than normal weight adolescents (Ting et al., 2012).

. A bidirectional relationship is suggested by past research as depressive symptoms appear to predict increases in weight, and overweight/obese status is independently related to increased depressive symptoms (de Wit, Straten, Herten, Pennix, & Cuijpers, 2010; Herva, et al., 2006; Sanchez-Villegas et al., 2010). However, the relationship between BMI and depression

appears to be more complex than a simple linear association (de Wit et al., 2010). De Wit et al. (2010) found, in a sample of 43,000 people, the relationship between BMI and depression more closely resembles a U, indicating that depressive symptoms are more common in obese or extremely underweight men. However, men with highest BMIs report the most severe depressive symptoms (Dragan & Akhtar-Danesh, 2007).

*Body Weight and Depression in College Men***.** Young men and women (ages 18-29) are a vulnerable population for high rates of obesity (Mokdad et al., 1999), which appears associated with shame, guilt, and/or body dissatisfaction (Friedman & Brownell, 2002). Furthermore, college-aged students are at high risk for gaining weight and developing depressive symptoms (Odlaug et al., 2015). Recent observations indicate that nearly one-third of all college students are overweight or obese (Odlaug et al., 2015). Specifically, among college-aged males, obese men reported greater depressive symptoms as assessed by the Patient Health Questionnaire (PHQ-9) compared to male students of normal BMI (Odlaug et al., 2015). Obese males were also more likely to report history of major depressive disorder compared to both men classified as overweight or normal weight (Odlaug et al., 2015).

APPENDIX C

DEBRIEFING LETTER

Dear Research Participant:
Thank you for participating in our study. Our goal was to collect data to understand the psychological and social factors that contribute to disturbed eating and body image in adult males. The majority of research about eating and body image disturbances addresses females only, and the research from this study will facilitate a better understanding of these problems among men.

We hope that taking this questionnaire was not stressful for you. Nevertheless taking a questionnaire can cause stress and tension about life problems. If you have any questions about eating and/or body image disturbance, please let the researcher know right now. We can help you get an appointment with a mental health professional. If you have any questions after you leave today or would like help at a later date, call Dr. Trish Kaminski at (940-565-2671).

The following is a list of names and phone numbers of help lines and agencies that offer counseling and other services to help men with problems they might have dealing with eating and/or body image disturbances.

Counseling and Testing Services (UNT, Denton) – offers personal counseling services on campus to all students at no charge [940-565-2741].

National Alliance for The Mentally Ill – offers one on one conversation with someone who can help answer your questions, and is toll free [1-800-950-NAMI].

Massachusetts Eating Disorder Association, Inc. (www.medainc.org) Help line – staffed by trained/supervised individuals that can help you with your questions [617-558-1881].

National Eating Disorders Association (www.nationaleatingdisorders.org) – provides resources, education, and support to individuals affected by eating and body image disturbances [1-800-931-2237]

Psychology Clinic (UNT, Denton) – individual assessment and therapy with fees set according to income level [940-565-2631].

The results of our study will be available to you in the future. If you would like a copy of our results, please give us your address now or contact us at a later date. You may keep this sheet for your records.

APPENDIX D

DEMOGRAPHIC QUESTIONNAIRE

1. Ethnicity: (1) ❑ Asian-American (4) ❑ Latin-American
(2) ❑ African-American (Black) (5) ❑ Native-American
(3) ❑ European-American (Caucasian) (6) ❑ Other

2. Age: (1) ❑ 18 (2) ❑ 19 (3) ❑ 20 (4) ❑ 21 (5) ❑ 22 (6) ❑ 23
(7) ❑ 24 (8) ❑ Over 24

3. Class Rank: (1) ❑ Freshman (3) ❑ Junior
(2) ❑ Sophomore (4) ❑ Senior

4. Are you a serious athlete? (i.e., play(ed) for a high school or college team, or train(ed) on your own) (1) Yes ❑ (2) No ❑

If yes, what sports or activities are you currently involved in?

College	(1) Yes	(2) No	Intramural	(1) Yes	(2) No
a. football	❑	❑	j. flag football	❑	❑
b. basketball	❑	❑	k. golf	❑	❑
c. golf	❑	❑	l. water polo	❑	❑
d. track	❑	❑	m. tennis	❑	❑
e. hockey	❑	❑	n. volleyball	❑	❑
f. lacrosse	❑	❑	o. soccer	❑	❑
g. cross country	❑	❑	p. basketball	❑	❑
h. swimming	❑	❑	q. weightlifting	❑	❑
i. diving	❑	❑	r. softball	❑	❑
s. martial arts	❑	❑			

t. other (Please describe) (1) ❑ _____
_____

5. In an average week, about how many hours do you spend working out? (Pleas describe) _____
_____

6. What is your current weight? _____

7. How tall are you? Ft._____ In._____

8. How certain are you that the number in question 6 is your accurate weight?
(1) Very uncertain❑ (2) Somewhat uncertain ❑ (3) Somewhat certain❑ (4) V certain ❑

9. How certain are you that the number in question 7 is your accurate height?
(1) Very uncertain❑ (2) Somewhat uncertain ❑ (3) Somewhat certain❑ (4) V certain ❑

10. What was the most you have ever weighed? _____

11. What was the least you have weighed as an adult? _____

12. What do you think is your ideal weight? _____

13. How many hours of television do you watch per day?

Less than 2 ❑ 2 to 4 ❑ 4 to 6 ❑ 7 or more ❑

14. How would you classify your sexual orientation?

(1) Straight/heterosexual ❑ (2) Gay/homosexual ❑ (3) Bisexual ❑

REFERENCES

An, R. (2014). Prevalence and trends of adult obesity in the US, 1999–2012. *ISRN obesity, 2014*.

Barlow, S. E. & Dietz, W. H. (1998) Obesity evaluation and treatment: expert committee recommendations. *Journal of Pediatrics, 102*(3), 29.

Bergeron, D., & Tylka, T. L. (2007). Support for the uniqueness of body dissatisfaction from drive for muscularity among men. *Body Image, 4*(3), 288-295.

Bracken, B. A. (1996). *Handbook of self-concept: Developmental, social, and clinical considerations*. John Wiley & Sons.

Brand, P. A., Rothblum, E. D., & Solomon, L. J. (1992). A comparison of lesbians, gay men, and heterosexuals on weight and restrained eating. *International Journal of Eating Disorders, 11*(3), 253-259.

Brown, R. (1998). Review of the Tennessee Self-Concept Scale, 2nd edition. *The thirteenth mental measurements yearbook*, 1010-11. Lincoln, NE: Buros Institute of Mental Measurements.

Carels, R. A, Wott, C. B., Young, K. M., Gumble, A., Koball, A., & Oehlhof, M. W. (2010) Implicit, explicit, and internalized weight bias and psychosocial maladjustment among treatment-seeking adults. *Eating Behaviors, 11*, 180–185.

Carey, M., Small, H., Yoong, S. L., Boyes, A., Bisquera, A., & Fisher, R. S. (2014). Prevalence of comorbid depression and obesity in general practice: A cross-sectional survey. *British Journal of General Practice, 64*(620), 122-127.

Carpenter, K. M., Hasin, D. S., Allison, D. B., & Faith, M. S. (2000). Relationships between obesity and DSM-IV Major Depressive Disorder, suicide ideation, and suicide attempts: Results from a general population study. *American Journal of Public Health, 90*(2), 251-257.

Centers for Disease Control and Prevention (CDC). (2016). *Defining Adult overweight and obesity: Adult body mass index (BMI).* Retrieved from: https://www.cdc.gov/obesity/adult/defining.html.

Chiang, K. J., Lu, R. B., Chu, H., Chang, Y. C., & Chou, K. R. (2008). Evaluation of the effect of a life review group program on self-esteem and life satisfaction in the elderly. *International Journal of Geriatric Psychiatry, 23*(1), 7-10.

de Wit, L. M., van Straten, A., van Herten, M., Penninx, B. W., & Cuijpers, P. (2010). Depression and body mass index, a u-shaped association. *BMC Public Health, 9*(14).

Dishman, R. K., Hales, D. P., Pfeiffer, K. A., Felton, G., Saunders, R., Ward, D. S…. Pate, R. R. (2006). Physical self-concept and self-esteem mediate cross-sectional relations of

physical activity and sport participation with depression symptoms among adolescent girls. *Health Psychology, 25*(3), 396-407.

Dragan, A. & Akhtar-Danesh, N. (2007). Relation between body mass index and depression: a structural equation modeling approach. *BMC Medical Research, 7*(17).

Derogatis, L. R. (1994). *Self-ConceptL-90-R administration, scoring, and procedure manual*: Third edition.

Eisenberg, D., Nicklett, E. J., Roeder, K., & Kirz, N. E. (2011). Eating disorder symptoms among college students: Prevalence, persistence, correlates, and treatment-seeking. *Journal of American College Health, 59*(8), 700-707.

Fisher, S. & Hood, B. (1987). The stress of the transition to university: A longitudinal study of psychological disturbance, absent-mindedness and vulnerability to homesickness. *British Journal of Psychology, 78*, 425-441.

Fitts, W. H. & Warren, W. L. (1996) Tennessee Self-Concept Scale: Second edition.

Flegal, K. M., Kruszon-Moran, D., Carroll, M. D., Fryar, C. D., & Ogden, C. L. (2016). Trends in obesity among adults in the United States, 2005 to 2014. *Journal of American Medical Association, 315*(21), 2284-2291.

Franzoi, S. L., & Shields, S. A. (1984). The Body Esteem Scale: Multidimensional structure and sex differences in a college population. *Journal of Personality Assessment, 48*(2), 173-178.

Friedman, K. E., Reichmann, S. K., Costanzo, P. R., & Mustante, G. J. (2002). Body image partially mediates the relationship between obesity and psychological distress. *Obesity Research, 10*(1), 33-41.

Friedman, K. E., Reichmann, S. K., Costanzo, P. R., Zelli, A., Ashmore, J. A., & Musante, G. J. (2005). Weight stigmatization and ideological beliefs: Relation to psychological functioning in obese adults. *Obesity Research, 13*, 907–916.

Friedman, M. A., & Brownell, K. D. (2002). Psychological consequences of obesity. In: Fairburn, C. G., Brownell, K. D. (Eds). *Eating disorders and obesity: A comprehensive handbook* (pp. 393-398). New York: Guilford Press.

Fryar, C. D., Carroll, M. D., & Ogden, C. L. (2012). Prevalence of overweight, obesity, and extreme obesity among adults: United States, Trends 1960-1962 through 2009-2010. *Health-E Statistics.*

Goodman, E. & Whitaker, R. C. (2002). A prospective study of the role of depression in the development and persistence of adolescent obesity. *Pediatrics,* 109, 497-504.

Grieve, F. G. (2007). A conceptual model of factors contributing to the development of muscle dysmorphia. *Eating Disorders, 15*(1), 63-80.

Grogan, S., & Richards, H. (2002). Body image: Focus groups with boys and men. *Men and Masculinities*, *4*(3), 219-232.

Grossbard, J. R., Lee, C. M., Neighbors, C., & Larimer, M. E. (2009). Body image concerns and contingent self-esteem in male and female college students. *Sex Roles*, *60*(3-4), 198-207.

Haas, H. I. & Maehr, M. L. (1965). Experiments on the concept of self and reaction of others. *Journal of Personality and Social Psychology, 1*(1), 100-105.

Haidar, Y. M. & Cosman, B. C. (20111). Obesity epidemiology. *Clinics in Colon and Rectal Surgery*, *24*, 205–210.

Hallinan, M. T., & Kubitschek, W. N. (1999). Curriculum differentiation and high school achievement. *Social Psychology of Education*, *3*(1-2), 41-62.

Harter, S. (1983). Developmental perspectives on the self- system. In E. M. Hetherington (Ed.), P. H. Mussen (Ed.*), Handbook of child psychology: Vol. 4. Socialization, personality, and social development* (4th ed., pp. 275-385). New York: Wiley.

Harter, S. (1985). Competence as dimensions of self-evaluation: Toward a comprehensive model of self-worth. In R. L. Leahy (Ed.), *The development of self* (pp. 55-122). New York: Academic Press.

Harter, S. (1988). Developmental processes in the construction of the self. In T. D. Yawkley & J. E. Johnson (Eds), *Integrative processes and socialization: Early to middle childhood* (pp. 45-78). Hillsdale, NJ: Lawerence Erlbaum Associates Inc.

Harter, S. (1993). Causes and consequences of low self-esteem in children and adolescents, In *Self-esteem: The puzzle of low self-regard.* (pp. 87-116). New York, NY: Springer US.

Harter, S., & Pike, R. (1984). The pictorial scale of perceived competence and social acceptance for young children. *Child Development*, 1969-1982.

Harter, S., Waters, P., & Whitesell, N. R. (1998). Relational self-worth: Differences in perceived worth as a person across interpersonal contexts among adolescents. *Child Development*, *69*(3), 756-766.

Hayes, A. F. & Preacher, K. J. (2014). Statistical mediation analysis with a multicategorical independent variable. *British Journal of Mathematical and Statistical Psychology, 67*, 451-470.

Herva, A., Rasanen, P., Miettunen, J., Timonen, M., Laksy, K., Veijola, J.,… Joukamaa, M. (2006). Co-occurrence of metabolic syndrome with depression and anxiety in young adults: The northern Finland 1966 birth cohort study, *68*(2), 213-216.

Herzog, D. B., Newman, K. L., & Warshaw, M. (1991). Body image dissatisfaction in homosexual and heterosexual males. *Journal of Nervous and Mental Disease*, *179*(6), 356-359.

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review, 94*(3), 319-340.

Higgins, E. T., Klein, R., & Strauman, T. (1985). Self-Concept discrepancy theory: A psychological model for distinguishing among different aspects of depression and anxiety. *Social Cognition*, *3*(1), 51-76.

Hilbert, A., Braehler, E., Haeuser, W., & Zenger, M. (2014). Weight bias internalization, core self-evaluation, and health in overweight and obese persons. *Obesity, 22*, 79-85.

IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.

Jia, H., & Luetkin, E. (2005). The impact of obesity on health-related in the general adult US population. *Journal of Public Health,* 27(2), 156-164.

Jones, D. C., & Crawford, J. K. (2005). Adolescent boys and body image: Weight and muscularity concerns as dual pathways to body dissatisfaction. *Journal of Youth and Adolescence*, *34*(6), 629-636.

Kaminski, P. L., Chapman, B. P., Haynes, S. D., & Own, L. (2005). Body image, eating behaviors, and attitudes toward exercise among gay and straight men. *Eating Behaviors*, *6*(3), 179-187.

Kaminski, P. L., & Hayslip Jr, B. (2006). Gender differences in body esteem among older adults. *Journal of Women & Aging*, *18*(3), 19-35.

Kaminski, P. L. & McFarland, M. B. (March, 2006). *Assessing male body image: Complexities & conundrums*. Presented at the Annual Scientific Exchange and workshops of the Society for Personality Assessment, San Diego, CA.

Kaminski, P. L., Shafer, M. E., Neumann, C. S., & Ramos, V. (2005). Self-concept in Mexican American girls and boys: validating the Self-Description Questionnaire-I. *Cultural Diversity and Ethnic Minority Psychology*, *11*(4), 321.

Keel, P. K., Baxter, M. G., Heatherton, T. F., & Joiner Jr, T. E. (2007). A 20-year longitudinal study of body weight, dieting, and eating disorder symptoms. *Journal of Abnormal Psychology*, *116*(2), 422.

Kennedy, A. P., Shea, J. L., & Sun, G. (2009). Comparison of the classification of obesity by BMI vs. Dual-energy X-ray absorptiometry in the Newfoundland population. *Obesity, 17*(11).

King, K. A., Vidourek, R. A., Davis, B., & McClellan, W. (2002). Increasing self-esteem and school connectedness through a multidimensional mentoring program. *Journal of School Health*, *72*(7), 294-299.

Kostanski, M. & Gullone, E. (1998). Adolescent body image dissatisfaction relationships with self-esteem, anxiety, and depression controlling for body mass. *Journal of Child Psychology and Psychiatry, 39*(2), 255-262.

Leo, R., Di Lorenzo, G., Tesauro, M., Cola, C., Fortuna, E., Zanasi, M., ... & Romeo, F. (2006). Decreased plasma adiponectin concentration in major depression. *Neuroscience Letters*, *407*(3), 211-213.

Lowery, S. E., Kurpius, S. E. R., Befort, C., Blanks, E. H., Sollenberger, S., Nicpon, M. F., & Huser, L. (2005). Body image, self-esteem, and health-related behaviors among male and female first year college students. *Journal of College Student Development*, *46*(6), 612-623.

Ludwig, D. J., & Maehr, M. L. (1967). Changes in self-concept and stated behavioral preferences. *Child Development*, *38*, 453-4

Marsh, H. W. (1989). Age and sex effects in multiple dimensions of self-concept: Preadolescence to early-adulthood. *Journal of Educational Psychology, 81*, 417–430.

Marsh, H.W. (2007). *Self-concept theory, measurement and research into practice: The role of self-concept in educational psychology.* Leicester, UK: British Psychological Society.

Marsh, H. W., Craven, R. G., & Debus, R. L. (1991). Self-Concepts of young children aged 5 to 8: Their measurement and multidimensional structure. *Journal of Educational Psychology*, *83*, 377–392.

Marsh, H. W., Craven, R. G., & Debus, R. L. (1998). Structure, stability, and development of young children's Self-Concepts: A multicohort– multioccasion study. *Child Development*, *69*, 1030–1053.

Marsh, H. W., Hey, J., Roche, L. A., & Perry, C. (1997). Structure of physical self-concept: Elite athletes and physical education students. *Journal of Educational Psychology, 89*(2), 369.

Marsh, H.W., Parada, P.H. & Ayotte, V. (2004). A multidimensional perspective of relations between self-concept (Self Description Questionnaire II) and adolescent mental health (Youth Self-Report). *Psychological Assessment*, *16*(1), 27–41.

Marsh, H. W., & Richards, G. E. (1988). Tennessee Self Concept Scale: Reliability, internal structure, and construct validity. *Journal of Personality and Social Psychology, 55*(4), 612.

Marsh, H. W., & Shavelson, R. (1985). Self-concept: Its multifaceted, hierarchical structure. *Educational Psychologist*, *20*, 107–125.

Mather, A. A., Cox, B. J., Enns, M. W., & Sareen, J. (2009). Association of obesity with psychiatric disorders and suicidal behaviors in a nationally representative sample. *Journal of Psychosomatic Research, 66*, 277-285.

McCreary, D. R. & Sadava, S. W. (2001). Gender differences in relationships among perceived attractiveness, life satisfaction, and health in adults as a function of body mass index and perceived weight. *Psychology of Men & Masculinity, 2*(2), 108-116.

McFarland, M. B. & Kaminski, P. L. (2009). Men, muscles, and mood: The relationship between Self-Concept and body-image disturbances. *Eating Behaviors, 10,* 68-70.

McKay, M., & Fanning, P. (1992). *Self-esteem: A proven program of cognitive techniques for assessing, improving, and maintaining your self-esteem* (2nd ed.). Oakland, CA: New Harbinger.

Miller, A. H., Maletic, V., & Raison, C. L. (2009). Inflammation and its discontents: The role of cytokines in the pathophysiology of major depression. *Biological Psychiatry, 65*(9), 732–741

Mokdad, A., Serdula, M. K., Dietz, W. H., Bowman, B. A., Marks, J. S., & Koplan, J. P. (1999). The spread of the obesity epidemic in the United States. *Journal of the American Medical Assocation, 282,* 1519-1522.

Must, A., Spadano, J., Coakley, E. H., Field, A. E., Colditz, G., & Dietz W.H. (1999). The disease burden associated with overweight and obesity. *Journal of American Medical Association, 282*(16), 1523-1529.

Odlaug, B. L., Lust, K., Wimmelmann, C. L., Chamberlin, S. R., Mortensen, E. L., Derbyshire, K.,…Grant, J. E. (2015). Prevalence and correlates of being overweight and obese in college. *Psychiatry Research, 227,* 58-64.

Ogden, C. L., Carroll, M.D., Kit, B. K., & Flegal, K. M. (2012). Prevalence of obesity and trends in body mass index among US children and adolescents, 1999-2010. *Journal for American Medical Association, 307*(5), 483-490.

Ogden, C. L., Carroll. M. D., Kit, B. K. & Flegal, K. M. (2014). Prevalence of Childhood and Adult Obesity in the United States, 2011-2012. *Journal of American Medical Association, 311*(8).

Ogden, C. L., Flegal, K. M., Carroll, M. D., & Johnson, C. L. (2002). Prevalence and trends in overweight among US children and adolescents, 1999-2000. *JAMA, 288*(14), 1728-1732.

Olivardia, R., Pope Jr, H. G., Borowiecki III, J. J., & Cohane, G. H. (2004). Biceps and body image: The relationship between muscularity and self-esteem, depression, and eating disorder symptoms. *Psychology of Men & Masculinity, 5*(2), 112.

Orth, U., Robins, R. W., Trzesniewski, K. H., Maes, J., & Schmitt, M. (2009). Low self-esteem is a risk factor for depressive symptoms from young adulthood to old age. *Journal of Abnormal Psychology, 118*(3), 472.

Pedrelli, P., Nyer, M., Yeung, A., Zulauf, C., & Wilens, T. (2015). College students: Mental health problems and treatment considerations. *Academic Psychiatry, 39*(5), 503–511.

Petrie, T. A., & Greenleaf, C. A. (2007). Eating disorders in sport. *Handbook of sport psychology*, 352-378.

Phillips, A. G., & Hill, A. J. (1998). Fat, plain, but not friendless: Self-esteem and peer acceptance of pre-adolescent girls. *International Journal of Obesity Related Metabolic Disorders, 22*(4), 287—293.

Pliner, P., Chaiken, S., & Flett, G. L. (1990). Gender differences in concern with body weight and physical appearance over the life span. *Personality and Social Psychology Bulletin, 16*(2), 263-273.

Pope, H. G., Katz, D. L., & Hudson, J. I. (1993). Anorexia nervosa and "reverse anorexia" among 108 male bodybuilders. *Comprehensive Psychiatry, 34*(6), 406-409.

Popkin, B. M., Adair, L. S. & Ng, S.W. (2012). Global nutrition transition and the pandemic of obesity in developing countries. *Nutrition Review, 70*, 3–21

R Core Team (2013). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL http://www.R-project.org/.

Raison, C. L., Capuron, L., & Miller, A. H. (2006). Cytokines sing the blues: inflammation and the pathogenesis of depression. *Trends in Immunology, 27*(1), 24–31.

Raison, C. L., Borisov, A. S., Majer, M., Drake, D. F., Pagnoni, G., Woolwine, B. J., … Miller, A. H. (2009). Activation of CNS inflammatory pathways by interferon-alpha: Relationship to monoamines and depression. *Biological Psychiatry, 65*(4), 296–303.

Rivenes, A. C., Harvey, S. B., & Mykletun, A. (2008). The relationship between abdominal fat, obesity and common mental disorders: Results from the HUNT study. *Journal of Psychosomatic Research, 66*, 269-275.

Roberts, R. E., Kaplan, G. A., Shema, S. J., & Strawbridge, W. J. (2000). Are the obese at the greater risk for depression? *American Journal of Epidemiology, 152*, 163-170.

Romero-Corral, A., Somers, V. K., Sierra-Johnson, J., Thomas, R. J., Collazo-Clavell, M. L., Korinek, J., Allison, T. G., Batasis, J. A., Sert-Kuniyoshi, F. H., & Lopez-Jimenez. (2008). Accuracy of body mass index in diagnosing obesity in the adult general population. *International Journal of Obesity, 32*, 959-966.

Rosenberg, M. (1979). *Conceiving the self.* New York: Basic Books

Sanchez, F. J. P. & Roda, M. D. S. (2007). Relationship between Self-Concept and academic achievement in primary students. *Electronic Journal of Research in Educational Psychology, 1*(1), 1696-2095.

Sanchez-Villegas, A., Pimenta, A. M., Beunza, J. J., Guillen-Grima, F., Toledo, E., & Martinez-Gonzalez, M. A. (2010). Childhood and young adult overweight/obesity and incidence of depression in the SUN project. *Obesity, 18*, 1443-1448.

Shavelson, R. J., Hubner, J. J., & Stanton, G. C. (1976). Self-Concept: Validation of construct interpretations. *Review of Educational Research, 46*(3), 407-441.

Scheirer, M. A., & Kraut, R. E. (1999). Increasing educational achievement via Self-Concept change. *Review of Educational Research, 49*, 131-150.

Schlomer, G. L., Bauman, S., & Card, N. A. (2010). Best practices for missing data management in counseling psychology. *Journal of Counseling Psychology, 57*(1), 1-10.

Shah, N. R. & Braverman, E. R. (2012). Measuring adiposity in patients: the utility of body mass index (BMI), percent body fat, and leptin. *PLOS ONE, 7*(4).

Siemsen, E., Roth, A., & Oliveria, P. (2010). Common method bias in regression models with linear, quadratic, and interaction effects. *Organizational Research Methods, 13*(3).

Siever, M. D. (1994). Sexual orientation and gender as factors in socioculturally acquired vulnerability to body dissatisfaction and eating disorders. *Journal of Consulting and Clinical Psychology*, *62*(2), 252.

Spencer, E. A., Appleby, P. N., Davey, G. K., & Key, T. J. (2001). Validity of self-reported height and weight in 4808 EPIC-Oxford participants. *Public Health Nutrition, 5*(4), 561-565.

Stommel, M. & Schoenborn, C. (2009). Accuracy and usefulnesss of BMI measures based on self-reported weight and height: Findings from the NHANES & NHIS 2001-2006. *BMC Public Health, 9*, 421.

Tager, D., Good, G. E., & Morrison, J. B. (2006). Our bodies, ourselves revisited: Male body image and psychological well-being. *International Journal of Men's Health*, *5*(3), 228-237.

Ting, W., Huang, C., Tu, Y., & Chien, K. (2012). Association between weight status and depressive symptoms in adolescents: Role of weight perception, weight concern, and dietary restraint. *European Journal of Pediatrics, 171*, 1247-1255.

Tram, J. M. & Cole, D. A. (2000). Self-perceived and the relation between life events and depressive symptoms in adolescence: Mediator or moderator. *Journal of Abnormal Psychology, 109*(4), 753-760.

Trautwein, U., Ludtke, O., Koller, O., & Baumert, J. (2006). Self-esteem, academic Self-Concept, and achievement: How the learning environment moderates the dynamics of Self-Concept. *Journal of Personality and Social Psychology, 90*(2), 334-349.

Tylka, T. L. (2011). Refinement of the tripartite influence model for men: Dual body image pathways to body change behaviors. *Body Image, 8*(3), 199-207.

U.S. Department of Health and Human Services. (2008). *2008 Physical activity guidelines for Americans*. Retrieved from: Health.gov.

Van Houtte, M. (2005). Global self-esteem in technical/vocational versus general secondary school tracks: A matter of gender? *Sex Roles*, *53*(9), 753-761.

Wabitsch, M., Moss, A., & Kromeyer-Hauschild, K. (2014). Unexpected plateauing of childhood obesity rates in developed countries. *BMC Medicine*, *12*(1), 17.

Woodruff, E. J. (2012). *Testing a comprehensive model of muscle dysmorphia symptomatology in a nonclinical sample of men.* Available from Dissertations & Theses at University of North Texas; ProQuest Dissertations & Theses Global.

Yilmaz, Y. (2008) Psychopathology in the context of obesity: The adiponectin hypothesis. *Medical Hypotheses, 70,* 902-903.

Zhao, G., Ford, E. S., Chaoyang, L., Tsai, C., Dhingra, S., & Balluz, L. S. (2010). Waist circumference, abdominal obesity, and depression among overweight and obese U.S. adults: national health and nutrition examination survey 2005-2006. *BMC Psychiatry*, *11*, 130.